

Some documents and websites

White paper: [hep-ex/0211001](#)

Short paper: Physical Review D68, 012002, 2003

Update to studies: [hep-ex/0407047](#)

Accelerator paper: BNL-73210-2004-IR (sent to DOE)

You can obtain all of these at website: [nwg.phy.bnl.gov](#)

- The experiment is technically feasible. Costs include AGS upgrade, Hill, Proton transp., horns, decay tunnel.
- Cost does not include detector in an underground laboratory. The detector has applications beyond accelerator neutrinos. Proton decay, supernova neutrinos, atmospheric neutrinos, etc. Recent study shows that backgrounds for neutrino experiment are manageable. More simulation studies needed.

BNL effort

The working group has about 40 members.

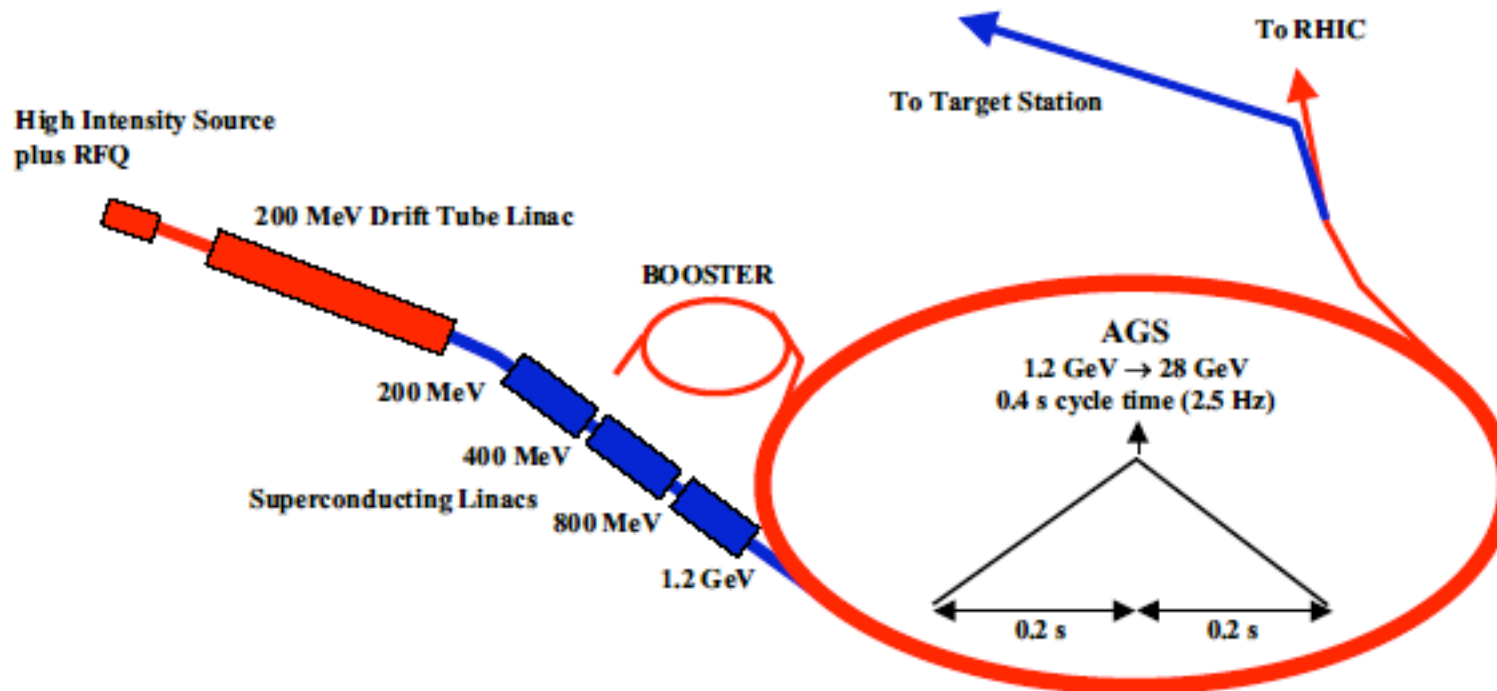
Physics members are about 10. Rest are from CAD. We also have a loose collaboration with the Stonybrook neutrino group focussed on software development for simulations.

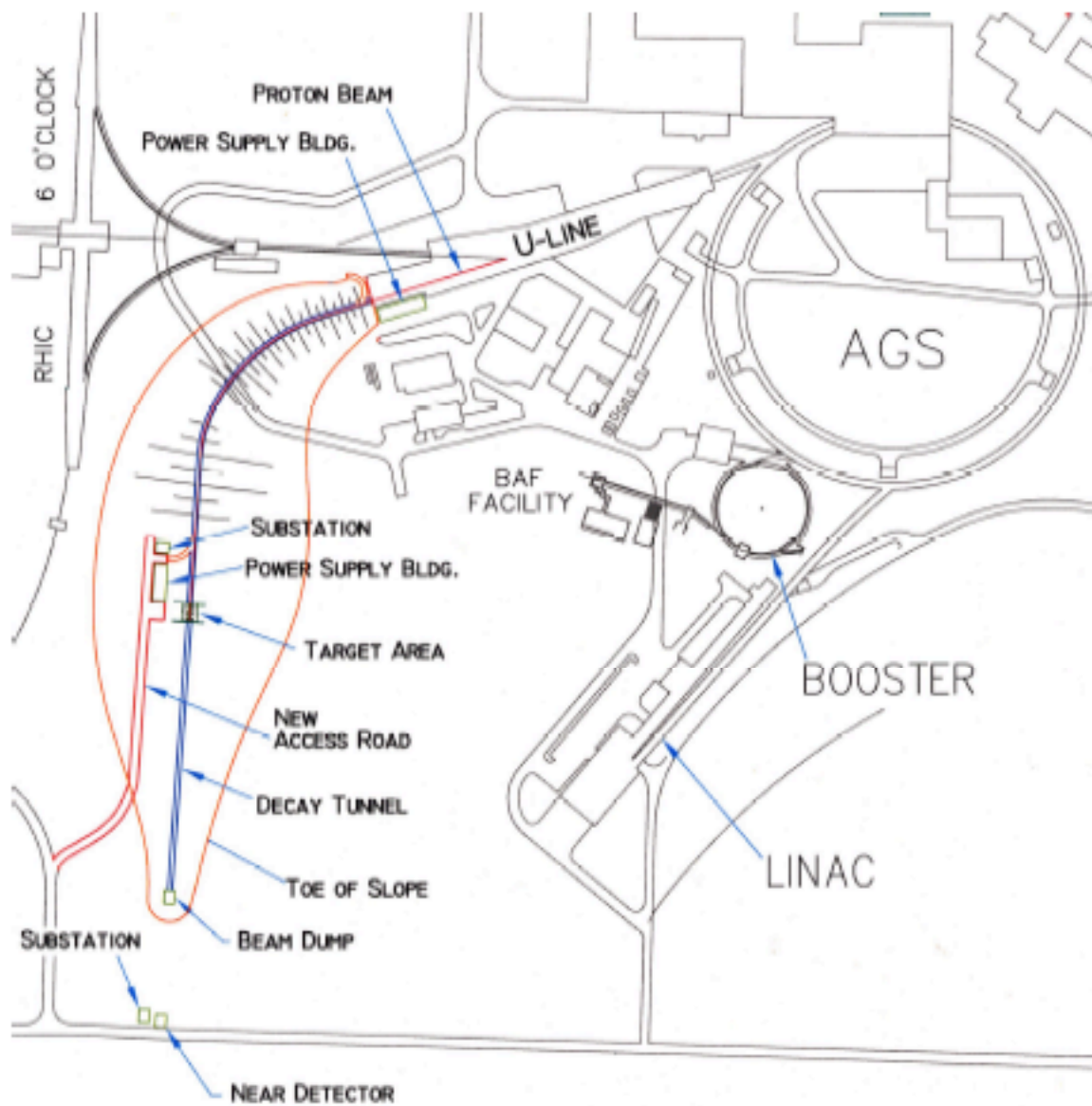
Direct support from BNL is through 1 LDRD grant: No. 04-043: \$106000/year for 2 years. The LDRD grant will expire in early 2006.

Some of the effort is going in the direction of participation in a Deep Underground Science Laboratory. This is an NSF initiative, at moment being led from Berkeley.

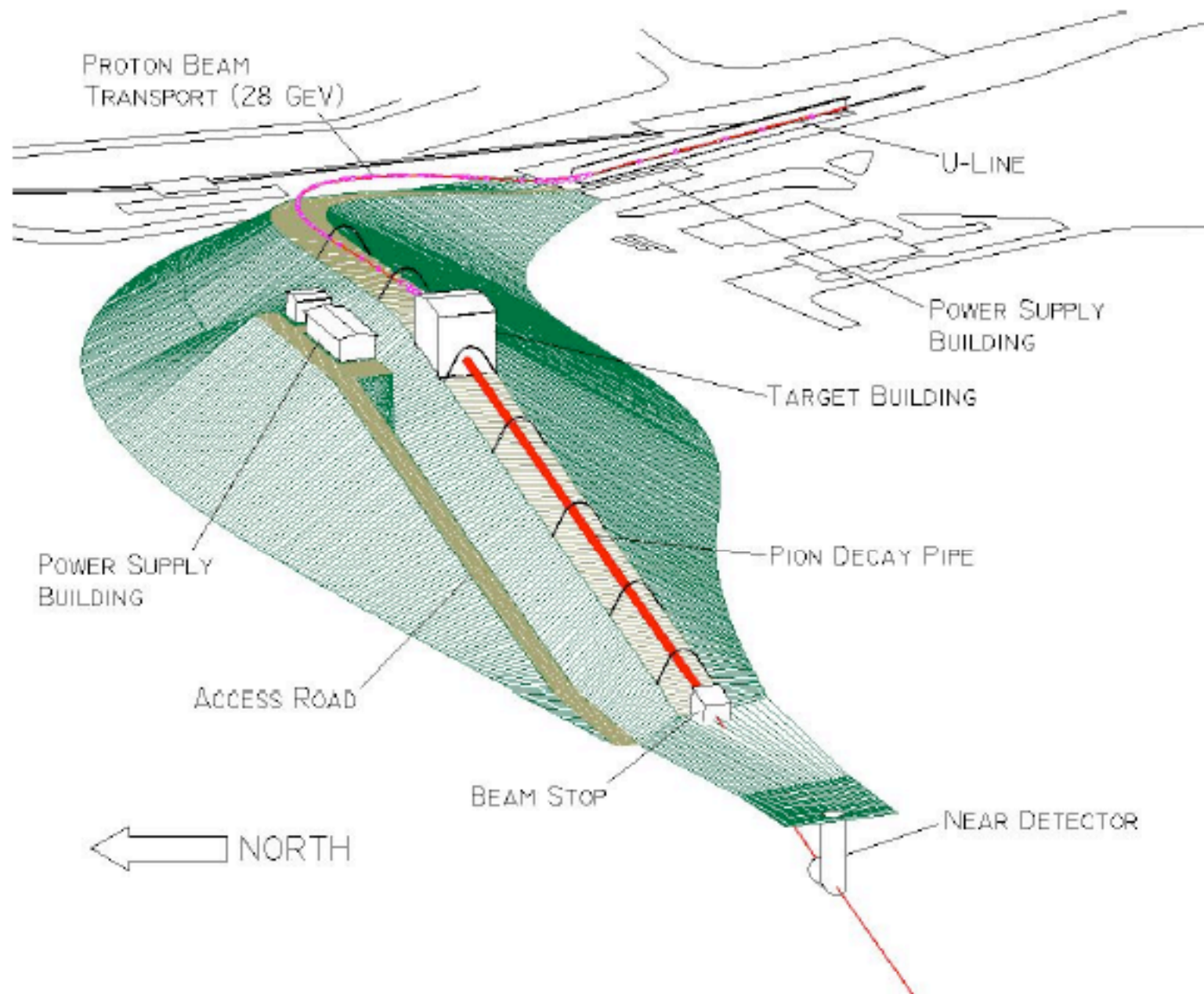
The Accelerator

- Conceptually simple upgrade. No magic.
- Run 28 GeV AGS at 2.5 Hz to get 1 MW.
- Need faster proton source: Super Conducting LINAC at 1.2 GeV
- Current: $7 \times 10^{13} ppp$ at 0.5 Hz \Rightarrow LINAC: $10^{14} ppp$ at 2.5 Hz.





← NORTH



AGS Super Neutrino Beam	EDIA	M&S	Labor	Total
LINAC system	6,897,116	98,556,970	16,783,762	122,219,848
AGS upgrade	10,496,245	53,619,159	6,472,590	70,587,994
Target and Horn system	664,742	3,417,152	1,208,338	5,290,232
Conventional Facility	7,550,300	60,090,300	1,210,700	68,851,300
ES&H	104,652	275,211	437,355	817,218
Project Support	1,148,681	384,109	4,096,963	5,629,753
Total	26,943,736	216,342,901	30,209,709	273,396,345

Table 1: Direct FY04 cost summary. Total becomes \$ 406.9M in FY04 dollars including 30% contingency and BNL project overhead (14.5%).

Cost Estimate of the AGS Super Neutrino Beam Facility

Construction Phase - Direct FY04 Dollars

0	AGS Super Neutrino Beam Facility	EDIA	M&S	Labor	Total
1.1	The Linac System	6,879,116	98,556,970	16,783,762	122,219,848
1.1.1	Front End and RT Linac Upgrade	313,000	2,383,000	856,000	3,552,000
1.1.2	SCL Accelerating Cavity System	954,240	22,254,200	11,040,000	34,248,440
1.1.3	SCL RF Source	3,620,988	51,688,800	402,332	55,692,120
1.1.4	SCL Cryogenic System	370,000	13,700,000	2,200,000	16,270,000
1.1.5	SCL Vacuum System	641,598	3,474,570	1,148,378	5,264,546
1.1.6	SCL Instrumentation	460,957	1,390,400	409,061	2,260,418
1.1.7	SCL Magnet and Power Supply	518,332	3,686,000	727,991	4,932,324
1.2	The AGS Upgrade	10,496,245	53,619,159	6,472,590	70,587,994
1.2.1	AGS Main Magnet Power Supply	503,959	28,200,000	1,342,337	30,046,296
1.2.2	AGS RF System Upgrade	6,082,625	9,850,000	675,847	16,608,472
1.2.3	AGS Injection/Extraction	644,000	6,437,066	1,668,330	8,749,396
1.2.4	Beam Transport to Target	1,636,771	7,852,241	2,637,290	12,126,302
1.2.5	Control System	1,628,890	1,279,852	148,786	3,057,528
1.3	The Target and Horn System	664,742	3,417,152	1,208,338	5,290,232
1.3.1	The Target System	127,008	229,284	50,130	406,422
1.3.2	The Horn System	454,524	2,358,568	656,224	3,469,316
1.3.3	Shielding and Remote Handling	83,210	809,300	125,300	1,017,810
1.3.4	Target & Horn Physics Support	0	20,000	376,684	396,684
1.4	The Conventional Facility	7,550,300	60,090,300	1,210,700	68,851,300
1.4.1	Linac Tunnel/Klystron Gallery	2,253,000	11,529,000	230,000	14,012,000
1.4.2	AGS Power Supply Building	2,024,000	13,347,000	432,000	15,803,000
1.4.3	Beam Transport and Target Area	1,674,300	25,091,000	172,500	26,937,800
1.4.4	The Decay Tunnel and Beam Stop	184,000	1,225,300	115,200	1,524,500
1.4.5	Site Utilities & Roads	1,088,000	6,820,000	140,000	8,048,000
1.4.6	Modifications for AGS RF System	327,000	2,078,000	121,000	2,526,000
1.5	ES&H	104,652	275,211	437,355	817,218
1.5.1	ES&H	20,000	105,000	270,000	395,000
1.5.2	Access Controls,	84,652	170,211	167,355	422,218
1.6	Project Support	1,148,681	384,109	4,096,963	5,629,753
1.6.1	Project Management	0	100,000	1,178,000	1,278,000
1.6.2	Technical Support	1,148,681	214,109	2,146,963	3,509,753
1.6.3	Project Controls	0	70,000	772,000	842,000
	AGS Super Neutrino Beam Facility Project Total	26,843,736	216,342,901	30,209,709	273,396,345

Construction Schedule

FY	1	2	3	4	5	6	7	8	9	10	→
R&D											
Construction											
Commissioning											
Research											